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MEASURING INTERNET ADDICTION IN ARAB BASED KNOWLEDGE SOCIETIES: A CASE STUDY OF SAUDI ARABIA

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ABSTRACT

As the technology is getting entwined with the lives of people, the adverse impacts are also mushrooming. Since decades, researchers have been trying to identify the reasons for such negative impacts with the help of various measuring tool. The present study used the modified version of the Widyanto's Internet Addiction Test questionnaire designed by introducing 'culture' construct to the existing three constructs. This tool is exercised for 306 respondents, selected at random in Saudi Arabia to know the extent of internet addiction prevalence and the triggering factors. Three levels of analysis are done on the data – basic analysis for demographic characteristics, binary logistic regression analysis and principal component analysis. The results revealed interesting facts about the internet usage phenomenon in Saudi Arabia. Though culture is added in the study tool to understand its impact on the level of internet usage, it is not highlighted in the final result. However, education level is proved to be the most influencing factor internet addiction. The principal component analysis also revealed that only the demographic factors like age, gender, income level and education are the variables that could explain the variation in the internet usage phenomenon to a greater extent. Thus, this study not only throws light on the influencing factors but also gives room for further analysis to look for the possible influencing factors such as the emotional/psychological, time management, mood management and culture in all the regions.

Keywords: *Internet Addiction (IA), Internet Addiction Test (IAT), Internet Gaming Disorder (IGD),, Online Cognitive Scale, Pathological Internet Use Scale (PIUS).*

1. INTRODUCTION

The advantages and disadvantages of any technology is always a debatable topic in the world. Internet technology, which has given a shift to the world also has no exception. Though the advantages are discussed by umpteen researchers, the adverse effect orientation has started with the initiation of APA (American Psychological Association) towards high internet usage, which is called addiction and is found as an attributable cause for mental and physical disorders of the internet users (Cheng et al., 2012; Hassan et al., 2016; Khan et al., 2017b). From then people started identifying the thin line between internet usage and internet addiction (Bozoglan et al., 2013; Khan and Awan, 2017; Laitinen, et al., 2016). Some defined it as an excessive usage with specific browsing duration (Evren et al., 2014; Secades et al., 2014), while others considered it as behavior specific (Burnay et al., 2015; Block, 2008; Shapira et al., 2003; Beard and Wolf, 2001). This internet addiction (IA) is mostly observed not only among the youngsters but also among the school going children. As the IA brought revolution with respect to social, economic and professional fronts, the adverse effects also persists in the respective domains (Beranuy et al., 2013; Khan, 2016; Komninos,2016). To understand the cause and effect of IA, studies have been evolving continuously with the help of various measuring tools called, scales. Since, IA is mostly behavior related, many psychological factors are used in the scales to know the influencing factors (Griffiths and Szabo, 2014). This paper is a trail to assess the influential factors for IA with the updated version of the tool constructed by Widyanto et al. (2011). That is, for the study tool developed by Widyanto et al. (2011), a new construct 'culture' is added. The tool is administered for the residents of Saudi Arabia to evaluate the factors that are causing internet addiction as well as the consequences of IA. To gain a better knowledge of these factors in

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different regions of the world, a thorough review of the existing studies is done. This review helped to understand various measuring tools designed by research fraternity to assess the possible factors and impact for internet/gaming addiction. The data thus collected is analyzed to understand the Saudi Arabia specific influences on the internet usage, in particular internet addiction.

2. REVIEW OF LITERATURE

Internet usage and internet addiction have been studied by many researchers with respect to various perspectives like positive, negative, geographic, social, professional and health and others. Some of the tools developed are Young's Internet Addiction Test, Problematic Internet Use Questionnaire, Online Cognitive Scale, and Pathological Internet Use Scale etcetera (Thatcher and Goolam, 2005; Davis et al., 2002; Young, 1998; Esmaeilpoorarabi, et al., 2016; Smuts et al., 2017).

Internet Addiction Test: The first form of the internet addiction test is the diagnostic questionnaire of Young, which is called as Young's Diagnostic Test (YDQ). The later version of this scale with certain changes is called the Young's Internet Addiction Test (IAT). This scale consists of 20 factors that are considered as consequence of excessive internet usage (Chang and Manlaw, 2008). Though the IAT is introduced couple of decades ago, the reason for its usage even today is its ability to assess the causal factors for various types of addictions. In addition, this scale is used to understand the correlates related with internet addiction like psychiatric comorbidity (Deng and Xuan, 2009; Ho et al., 2016). The intensity of internet addiction is decided by depending on the score of the scale for the questions measured using Likert Scale. Also, there is a felt need by the researchers to assure the dimensionality of the scale as well as the applicability of this scale to other types of research works associated with behavioral sciences. (Guofeng and Yuming, 2009; Bankole et al., 2017).

Problematic Internet Use Questionnaire: This questionnaire is mainly developed by basing on the concepts of Young's IAT as well as the pathological gambling questionnaire (Thatcher and Goolam, 2005b; Ejike et al., 2016). According to Chang and Manlaw (2008), the specificity of the tool is that it can help to measure the internet addiction with respect to three dimensions – online preoccupation (the intention to be online), adverse effects (negative outcomes experienced as a result of being online) and social interactions (usage of internet for developing social relations).

Online Cognitive Scale: The online cognitive scale is a Turkish style scale that comprises of 36 items on a 7 – point Likert scale. The sub-dimensions – the diminished impulse control (e.g., I use the Internet more than I ought to), loneliness / depression (e.g., I am bothered by my inability to stop using the Internet so much), social comfort (e.g., When I am online, I can be carefree) and distraction (e.g., I often use Internet to avoid doing unpleasant things). Depending on the value of the Likert Scale, the level of internet addiction is decided. The Cronbach Alpha for consistency also proved that the scale has the score 0.91.

Pathological Internet Use Scale (PIUS): It is a scale developed by Morahan-Martin and Schumacher in 2000. This scale has 13 questions to assess the multiple adverse effects of Internet use on the academic performance, behavior of individual level from personal level to social level, psychological impact and others.

Generalized Problematic Internet Use Scale: This scale is developed by Caplan (2002) considering the cognitive behavioral approach by identifying seven important constructs like mood alteration; social benefits; negative outcomes; compulsive use; excessive time online; withdrawal; social control.

Apart from the above mentioned scales and studies, there are many other studies that concentrated on internet usage and internet addiction in various geographic regions as well as in various socio-demographic settings. Though internet usage and internet addiction are well-known and well discussed topics, every study brings some or the other issue in to lime light, in particular. The extol review done by going through the works of various such authors related to the nitty-gritties of internet addiction is listed in the following table for the sake of better readability.

Table 1: Topics related to Internet Addiction and the Contributors

Fig 1: Linkages between various constructs of internet usage and interned addiction

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3. MATERIAL AND METHODS

The aim of the study being to know the influencing factors for internet addiction among the people of Saudi Arabia, the study tool designed by Widyanto et al. (2011) is considered and modifications are made to it. IAT is accepted by many researchers as a well-designed tool to measure the addiction level of individuals. The IAT scale developed by Widyanto et al. (2011) has the constructs related to emotional/psychological conflict, Mood modification and time management. These are used to assess the psychometric properties that are leading to IA. One of the reasons for the wide acceptability of IAT is its reliability and validity to measure the IA throughout the world (Chen and Nath, 2016). The explanation for the above said factors is provided as follows: the first factor emotional/psychological conflict deals with the tendencies of the internet addicts like, low-self-esteem, social discomfort and others. The second factor time management issues brings out the factors that insist the person to spend time on the net related activities, which otherwise spent in productive manner. Similarly, the third factor mood modification captures the psychological influences of the internet availability and deprivation like instable mental condition, depression and stress etcetera. Thus, multidimensional approach that is verified for its validity and reliability is the reason for the approval of this scale globally (Guofeng and Yuming, 2009; Khan and Ejike, 2017; Uwemi et al., 2016). Hence it is also considered for this analysis and for the existing factors, another factor culture is added to know the impact of culture on the internet addiction tendencies along with the original three factors of Widyanto.

Andreassen et al. (2012), advocated from their study about Bergen Work Addiction Scale that there is every need to extend the research work towards exploring the impact of culture on internet addiction. From the study done in China, Huang et al (2007) mentioned that as per the social culture of Chinese, internet chatting and internet communication is considered as the safest and convenient way. In addition, the growing influence of technology in educational, societal and familial culture is demanding the increased intervention of internet in people's lives. Chen and Nath (2016) added that the psychometric factors stated by Widyanto change according to various types of cultures. Thus, internet addiction and its relation with culture is highlighted by many researchers so that the role of culture (social, familial and others) in influencing the mindset of the individuals and making them addicted can be understood (Eyadat, et al. 2012; Chang and Manlaw, 2008; Cao and Su, 2007; Awan et al., 2016; Khan and Adediji, 2017).

So, having understood the necessity to include 'culture' among the factors that influence internet addiction along with the existing three, the questions related to culture are put in the modified tool. That is, for the existing constructs, new constructs 'culture' is added to know the extent of influence of culture on internet addiction along with the other mentioned constructs. The updated tool is used to collect the data from 306 respondents from Saudi Arabia. All respondents were Saudi nationals and living in Al-Hassa region of Saudi Arabia. Respondents were from different parts of KSA and living or working in Damam and Alkhobar cities. The selection of sample was based on use of internet in daily routine matters. Using the study tool, demographic information is collected first and the opinion of the respondents regarding the four types of constructs is collected using Likert scale. The scale has five points, ranging from strongly disagree to strongly agree. The collected data is tabulated and analyzed using the advanced statistical techniques. The basic demographic profile of the respondents is understood using the tabulation and chi-square techniques. The impact of the constructs on the level of internet addiction is understood using the logistic regression and the most influencing components for the internet usage are assessed with the help of principal component analysis and Factor analysis. The results of the analysis are tested at 5 % level of significance (α = 0.05) using the statistical package SPSS 16.0.

4. STATISTICAL ANALYSIS

The descriptive analysis reveal that there are 74% male and 26% female involved in the study and among the male, 38% are addicted to internet. But among the female, the addicted and non-addicted percentage is equal (50% each). Also, considering the segregation as per the educational level of the respondents, 41% are internet addicted. This percentage is appalling and is found to have significance with internet addiction. However, the proportion of the respondents belonging to the sub-levels of education, like high school, college graduate and university graduate are almost equal.

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Though the age wise segregation is not statistically significant, it shows that youngsters (below 24 years) are more addicted

to internet than their counter parts. The income level distribution reveal that among the internet addicted people, low income group proportion is more. Considering the nationality of the respondents, it can be understood that 59% are Saudi Arabians and the remaining are other nationalities and among the Saudi Arabians, 39% are found to be addicted to internet as shown in table 2.. The crosstab result of the continuous variables with internet addiction did not show much variation between addicted and non-addicted groups. Also, none of them are found to be at significant level.

Table: 2 - Descriptive Statistics for the Internet Addiction Data

On the whole, education alone is found to have association with the dependent variable, level of internet addiction. Unlike many previous studies (Fernández-Villa et al., 2015), the remaining variables like age, gender, income, nationality are found to be irrelevant with the status of internet addiction for the respondents of Saudi Arabia. Also, the constructs emotional index, time management index, mood management and culture index are not found to have relation with internet addiction. The reason for the non-significance of the variables other than education gives scope to look into the relations in future research.

Fig: 2 – Percentage of Internet Addiction
Fig: 3 – Internet addiction by gender
Fig: 4 – Relation between level of education and IA (Yes)
Fig: 5 – Relation between the Age and IA (Yes)
Fig: 6 – Relation between Income level and IA (Yes)
Fig: 7 – Relation between Nationality and IA (Yes)

After the descriptive narration of the variables involved in the study, trial is made to know the extent of impact of the independent variables on the dependent variable, level of internet addiction with the help of binary logistic regression analysis. This result is presented in the following table - 3. The odds ratio and the confidence intervals of the dependent variables affirm the relation that is already established with the help of the descriptive analysis. It is established with the help of analysis that, respondents at all levels of education are addicted to internet at significant levels.

Table -3: Output of Binary Logistic Regression

From the above output table of binary logistic regression, it can be understood that education alone is found to have significant impact on the dependent variable, level of internet addiction. Further, it can be understood that compared to respondents who have high school education, college graduates and university graduates are more addicted to internet. Though, the extent of professional utility of internet for the latter groups is an undeniable fact, the intensity is high with respect to the count. It is proved from the analysis that, college and university graduates are three times and two times more addicted to internet respectively than their counter parts.

In the next stage, principal component analysis is exercised through the factor analysis and the output is given below. The following table – 4 reveals the values of Kaiser-Meyer-Olkin (KMO) measure for adequacy check and the Bartlett's test of sphericity. The ideal value of KMO measure should be greater than 0.5 and in the present analysis, it is found to be 0.733 which shows that the selected sample is adequate for executing the factor analysis technique. Also, the Bartlett test of sphericity resulted in a significant p-value (0.001 for the present analysis) which is less than 0.05. The highly significant value indicates that there are some relationships between the variables of factor analysis and it is appropriate to use this technique.

Table 4: Result of KMO and Bartlett's Test

The next table – 5 elaborates the amount of variation that is explained by each factor individually as well as in combination. The percentage of variance in the phenomenon under study is referred to as the Eigen values. It is quite evident from the table that, the first four variables are able to explain majority of the variation in the internet usage patterns. Around 85 percentage of variation in the phenomenon can be explained by these factors – gender, education, and age and income level. Among them, gender details the variation in a much higher proportion, succeeded by education, age and finally the income level. Thus, the principal component analysis resulted in four components that are able to contribute to maximum variation in the study constructs and the same result is shown pictorially in the scree plot. Though it is an automatically generated graph between the component number and its

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corresponding Eigen value, it depicts the true picture of the principal component analysis.

Table 5: Total Variance Explained

Fig: 7 - Scree Plot

The Cattell Scree test plot, which is plotted for the component number against its Eigen value discloses the variation that is measureable by the contribution of each factor. From the figure - 7, it can be seen that the Eigen value of the first four factors are high (> 1) and then started becoming parallel to the x-axis, nearing zero. So, this figure affirms that the first four factors of the analysis explains the variation in the usage pattern of internet to the maximum.

5. DISCUSSION

There are many research works that established the role of culture and social norms in internet usage and spread of IT technology among Arab countries decades ago only (Al-Gahtani et al. 2007; Loch et al., 2003; Rose and Straub, 1998). Thoug the internet penetration in Saudi Arabia has started late in 1999 compared to the rest of the world because of the religious beliefs, it is obtained that by the year 2009, the toll of internet users grew to 7.7 million and majority (50%) of the users who use internet for mere chatting are below 25 years of age (Simsim, 2011). So, such a situation demands the researchers to know the ins and outs of internet usage and addiction levels in the country. Hence, the work is done in those lines by incorporating 'culture' in the internet addiction test tool, which revealed surprising facts. Thus the study aimed to know the factors that are influencing internet addiction using the modified scale of IAT for the people of Saudi Arabia, did not yield much interesting facts about culture. But, the uniqueness of the occurrence can be observed with respect to the construct, 'education level'. In the case of many studies, education is found to be a significant variable that has a bearing on level of internet addiction (Chen and Nath, 2016). The first level results of this analysis proved that 41% of the educated people are internet addicts. This number is quiet dreadful as more than one third are addicts to internet. It can also be understood from the binary logistic regression analysis that in comparison to individuals who had high school education, the college and university graduates are more addicted to internet. This advocates positive as well as negative issues. On one side of the coin, this fact reveals that compared to the individuals with school level education, college and university graduates are more techno savvy and on the other side, it reveals that the latter group is more prone to the physical and psychological disorders that occur because of the internet addiction.

Fig: 8 – Results of Logistic regression

The above figure – 8 depicts a clear picture about the dependent and independent variables and their odds ratios obtained using the binary logistic regression analysis. The values given with the variables are the odds ratios of the second and third sub-variables against the reference variable. Some of the variables/constructs mentioned in the following diagram are inter-related and others are independent among themselves. Research proved that the constructs – emotional/psychological conflict, time management, mood management and culture are not mutually independent (Burnay et al., 2015); (Andreou and Svoli, 2013). To denote this mutual dependence among the constructs, the corresponding circles are represented in overlapping manner and the demographic variables are represented with the help of individual circles. However, the extent of dependency is not represented in the figure.

For this analysis, first sub-variable of any main variable is considered as reference variable. That is, for the variable 'age', the sub-variables are 'young (<= 24 yrs)', 'middle (25-44)' and 'old (>=45)', while 'young (<=24)' is considered as reference variable. So, the values mentioned in the figure – 8 are the odds ratios of second and third sub-variables. Similarly, for the 'Gender', 'female' is the reference variable and the odds ratio of the second sub-variable is given in the figure with 'Gender'. For 'income level', 'low' is the reference variable and the odds ratio of the remaining sub-variables 'middle' and 'high' are given in the figure. For the 'level of education', the reference variable is 'high school' and the odds ratio value of the latter two variables are given in the figure. Lastly, for the variable 'nationality', 'Saudi' is the reference variable and the value of the other variable is mentioned in the following figure. The variable that has odds ratio at significant level is denoted with red *.

On the whole, the above figure helps to understand the output of binary logistic regression. This output, which also supports the descriptive analysis highlights the role and significance of education in

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managing the internet addiction levels of the people. Also, the KMO test and Bartlett's measures approves the usage of factor analysis to know the principal components for the internet usage in Saudi Arabia. The analysis extracted four components (Gender, Age, Income level and Level of education) which are able to explain maximum amount of variation in the phenomenon of internet usage. So, it can be considered that the above cited four factors are the principal components for the analysis.

It is very surprising to observe from the results that none of the stages of the analysis conducted in the paper exhibited the impact of the constructs of IAT. This result gives two types of indications. First, the size of the sample collected for the study should be ample for the analysis and second, the sample should be collected in a representative manner to cover all sections of people. Also, the output advocates to look for the impact of the modified study tool (by including the construct, 'culture') in the forthcoming research work done in culture influenced regions/countries with a well-defined sample.

The study considered data from both urban and rural areas. But as per the review, the intensity of internet addiction is more in urban domains rather in rural domains (Lemos et al., 2016; Youssef et al., 2014). Jie et al. (2014) proved from their analysis that the percentage prevalence of internet addiction among urban students is 9.4 and that of rural students is 2.8. So, it is much necessary to plan strategies to control the addictive nature of urban internet users. The moral panic theory has directed some programmes like leisure activities in urban areas in order to decrease the effect of internet addiction (Szablewicz, 2010). Hence, if the study tools are designed alone for urban users rather for both, results could be germane. The outcomes of this paper are also useful for urban planning and development of Saudi Arabia. Concern government authorities can consider the finding of the current research while planning for their years and five yearly plan. It is very common in underdeveloped countries to develop any urban plan without proper research and this kind of research can provide a good base of input for decision makers.

6. CONCLUSION

Since the advent of the quantitative tools/scales to assess the ramifications of internet usage both positively and negatively, there has been a big debate about the triggering factors and the resultant factors (Andreassen et al., 2012). It has been widely argued by the extol literature that many factors related to social, demographic, lifestyle related constructs have a bearing on the phenomenon that is of interest (Karim and Nigar, 2014). The possible reasons for not getting such results in the present analysis could be numerous – inadequacy of the sample, variation in the data collected, presence of sampling or non-sampling errors. However, the role of education is very much established in both descriptive analysis and binary logistic regression analysis. As it is found that internet addiction is more prevailing among the people having higher education than their counter parts, measures to hedge the group against the adverse effect of internet addiction at local and global levels are the need of the hour. In addition to this, the results of the principal component analysis reveal that, the factors like gender, age, income and education levels are able to explain the variation in the internet usage phenomenon. So, the results of the analysis lead to many theoretical and managerial implications.

6.1. Theoretical and Managerial Implications

The analysis thus carried out by using the modified IAT tool could not bring out the actual impact of the culture on the level of internet usage. Nonetheless, the results confirmed the role of education and hence suggested theoretical and managerial mediations in that regard. Unlike the studies established results using various tools, this analysis did not exhibit the impact of any of the constructs used in the IAT, study could not bring out the impact of culture on interment usage/addiction with the help of the modified IAT tool. So, this advocates the necessity to develop an appropriate model and hence tool to capture the triggering factors of internet addiction in various cultures. It can also be inferred that rather than adopting a common tool for all geographic, demographic and cultural setting, customized models and tools can work well in bringing the submerged issues into limelight.

In addition to these ventures, framing policies and programmes aimed to streamline the extent of usage of internet could make a difference in the society with respect to the physical and psychological health of the people. In the present day world, as the professional lives are very much entwined with the usage of internet, developing and practicing the approaches and measures to

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safeguard from the adverse effects of excessive internet usage can benefit the communities to a greater extent.

6.2. Limitations of the study

As discussed above the results of this study are different from many other studies in this domain. Though this discrepancy could be trivial, it can even be understood with respect to the limitations of the study. The possible limitations of the study could be inadequacy of the sample size, variation in the data collected and presence of sampling or non-sampling errors and many other factors. Apart from the above, the role of constructs of the original IAT - viz., emotional/psychological conflict, time management and mood management is also not visible in the final results. As this is a situation of serious concern that either of the effects of the constructs on internet usage got vanished in the output of analysis, all the procedures related to the selected study tool, sampling and non-sampling can be monitored meticulously for prospective studies.

Another hitch of the study could be the sample which is collected from both rural and urban areas together. As the literature suggests that internet addiction is more prevailing among urban areas than rural, tools designed by aiming at the urban people can refine the results and may suggest better solutions for the technology based disorders. Also, these limitations may direct a way for the future research aspirants to look into this concept in such a way that though 'culture' is very much influential in Saudi Arabia, it is not highlighted in the results of the analysis. Similar diagnostic approach in the case of the remaining constructs with a better sample size and by overcoming the above cited errors can give better results.

REFRENCES:

[1] Al-Gahtani S. S., Hubona, G. S. and Wang, J. (2007), 'Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT', Information & Management, Vol. 44, pp. 681–69.

[2]. Andreassen, C. S., Griffiths, M. D., Hetland, J., & Pallesen, S. (2012). Development of a work addiction scale. Scandinavian Journal of Psychology, 53(3), 265-272. doi: 10.1111/j.1467-9450.2012.00947.x

[3]. Andreassen, C. S., Torsheim, T., Brunborg, G. S. and Pallesen, S. (2012), 'Development of a Facebook addiction scale', Psycho-logical Reports, Vol. 110, pp. 501–517.

[4]. Andreou, E. and Svoli, H. (2013), 'The Association between Internet User Characteristics and Dimensions of Internet Addiction among Greek Adolescents', International Journal of Mental Health and Addiction, Vol. 11 No. 2, pp. 139-148.

[5]. Askoul, R., Khan, H.U. and Madhavi Lalitha, V.V. (2016) 'Cross-functional integration of marketing and information services in banking: a cross-industry comparison', International. Journal of Process Management and Benchmarking, Vol. 6. No. 1. pp. 57-78

[6]. Awan, M. A., Khan H.U. and Zhang, W. (2012) 'A comparative study on Online Service Quality Perception of two Major Regional Economies', International Journal of e-Education, e-Business, e-Management and e-Learning(IJEEEE), Vol. 2, No.6, P.529-551.

[7]. Awan, M. A., Khan, H. U. & Ho, H. C. (2016), "Online Banking: A Comparative Study Of Chinese And Saudi Customers Perceptions Of Service Quality", Journal of Internet Banking and Commerce, vol. 21, no. S5, pp. 1-31.

[8]. Awan, M.A., and Khan, H.U. (2016), "Status of Internet Addiction among College Students: A Case of South Korea", First American Academic Research Conference on Global Business, Economics, Finance and Social Sciences (AAR16 New York Conference), New York, USA, May 25- May 28, 2016. (Conference Proceeding).

[9]. Aydin, B. and Sari, V. S. (2011), 'Internet addiction among adolescents: the role of self-esteem', Procedia Social and Behavioral Sciences, Vol. 15, pp. 3500–3505.

[10]. Bankole, O. A., Lalitha, M., Khan, H.U., Jinugu, A. (2017), "Information Technology In The Maritime Industry Past, Present And Future: Focus On Lng Carriers", 7th IEEE International Advance Computing Conference, Hyderabad, India, January 5 – 7, 2017. (Conference Proceeding).

[11]. Bashir, G. M., Khan, H.U (2016b), "Factors Affecting Learning Capacity Of Information Technology Concepts In A Classroom Environment Of Adult Learner", 15th International Conference on Information Technology Based Higher Education and Training (IEEE Conference), Istanbul, Turkey, September 8th – September 10, 2016. (Conference Proceeding).

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[12]. Bashir, G. M., Khan, H.U., Fournier-Bonilla, S. D. (2016), "Applying Andragogy Theory to an Adult Multicultural Audience: How Cultural Factors Influence the Capacity for Adults to Learn Information Technology Concepts in a Classroom Environment", Northeast Decision Sciences Institute Conference, Alexandria, Virginia, USA, March 31st – April 2nd, 2016. (Conference Proceeding).

[13]. Beard, K. W. and Wolf, E. M. (2001), 'Modification in the proposed diagnostic criteria for Internet addiction', Cyberpsychol. Behav. Vol. 4, pp. 377–383.

[14]. Ben-Yehuda, N. (2009), 'Moral panics 36 years on', British Journal of Criminology, Vol. 49, pp. 1–3.

[15]. Beranuy, M., Carbonell, X. and Griffiths, M. D. (2013), 'A Qualitative Analysis of Online Gaming Addicts in Treatment', International Journal of Mental Health and Addiction, Vol. 11 No. 2, pp. 149-161.

[16]. Block, J. J. (2008), 'Issues for DSM-V: Internet addiction', The American Journal of Psychiatry, Vol. 165, pp. 306–307.

[17]. Bozoglan, B., Demirer, V. and Sahin, I. (2013), 'Loneliness, self-esteem, and life satisfaction as predictors of Internet addiction: A cross-sectional study among Turkish university students', Scandinavian Journal of Psychology, Vol. 54 No. 4, pp. 313-319.

[18]. Brock, V. F. and Khan H.U. (2017), "Are Enterprises Ready For Big Data Analytics? A Survey Based Approach", Int. J. of Business Information Systems, Vol.25, No.2, pp.256:277.

[19]. Burnay, J., Billieux, J., Blairy, S., and Larøi, F. (2015), 'Which psychological factors influence Internet addiction? Evidence through an integrative model', Computers in Human Behavior, Vol. 43, pp. 28-34.

[20]. Cao, F. and Su, L. (2007), 'Internet addiction among Chinese adolescents: Prevalence and psychological features. Child: Care', Health and Development, Vol. 33 No. 3, pp. 275-281.

[21]. Caplan, S. E. (2002), 'Problematic Internet use and psychological wellbeing: Development of a theory-based cognitive-behavioral measurement instrument', Computers in Human Behavior, Vol. 18, pp. 553–575.

[22]. Çardak, M. (2013), 'Psychological well-being and internet addiction among university students', Turkish Online Journal of Educational Technology, Vol. 12 No. 3, pp. 134-141.

[23]. Chang, M. K. and Manlaw, S. P. (2008), 'Factor structure for Young's Internet Addiction Test: A confirmatory study', Computers in Human Behavior, Vol. 24 No. 6, pp. 2597-2619.

[24]. Chen, L. and Nath, R. (2016), 'Understanding the Underlying Factors of Internet Addiction across Cultures: A Comparison Study', Electronic Commerce Research and Applications, Vol. 17, pp. 38–48.

[25]. Chen, Q., Quan, X., Lu, H., Fei, P. and Li, M. (2015), 'Comparison of the personality and other psychological factors of students with internet addiction who do and do not have associated social dysfunction', Shanghai Archives of Psychiatry, Vol. 27 No. 1, pp. 36-41.

[26]. Cheng, S. H., Shih, C. C., Lee, I. H., Hou, Y. W., Chen, K. C., Chen, K. T., and Yang, Y. C. (2012), 'A study on the sleep quality of incoming university students', Psychiatry Research, Vol. 197 No. 3, pp. 270-274.

[27]. Das, A. and Khan, H.U. (2016) "Security behaviors of smartphone users", Information and Computer Security, Information and Computer Security, Vol. 24, No.1, pp. 116-134

[28]. Davis, R. A., Flett, G. L. and Besser, A. (2002), 'Validation of a new scale for measuring problematic Internet use: Implications for pre-employment screening', Cyber psychology and Behavior, Vol. 5 No. 4, pp. 331–345.

[29]. Deng, G. and Xuan, Y. (2009), 'Internet addiction and mental health status of Chinese college freshmen', Paper presented at the 3rd International Conference on Bioinformatics and Biomedical Engineering, iCBBE 2009.

[30]. Ejike, A. C. , Khan, H.U., Fournier-Bonilla, S. D. (2016), "Possible Impact of Mobile Banking on Traditional Banking: A Case Study of Nigeria", Northeast Decision Sciences Institute Conference, Alexandria, Virginia, USA, March 31st – April 2nd, 2016. (Conference Proceeding).

[31]. Erfan Najmi, E., Hashmi, K., Malik, Z., Rezgui, A., Khan, H.U. (2015), "CAPRA: a comprehensive approach to product ranking using customer reviews", Computing, Vol. 97, No. 8, pp: 843-867.,

[32]. Esmaeilpoorarabi, N. , Yigitcanlar , T., Guaralda , M. (2016), "Towards an urban

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

quality framework: determining critical measures for different geographical scales to attract and retain talent in cities", Int. J. of Knowledge-Based Development, 2016 Vol.7, No.3, pp.290 – 312

[33]. Evren, C., Dalbudak, E., Evren, B., and Demirci, A. C. (2014), 'High risk of internet addiction and its relationship with lifetime substance use, psychological and behavioral problems among 10th grade adolescents', Psychiatria Danubina, Vol. 26 No. 4, pp. 330-339.

[34]. Eyadat, Y., Alzghoul, H. and Sharqawi, S. (2012), 'Determining the level of internet addiction among university students in Jordan: An issue of concern', Journal of Institutional Research South East Asia, Vol. 10 No. 1, pp. 113-125.

[35]. Fernández-Villa, T., Molina, A., García-Martín, M., Llorca, J., Delgado-Rodríguez, M. and Martín, V. (2015), 'Validation and psychometric analysis of the Internet Addiction Test in Spanish among college students', BMC Public Health, Vol. 15 No. 1, pp. 1-9.

[36]. Fioravanti G, Primi C and Casale S. (2013), 'Psychometric evaluation of the Generalized Problematic Internet Use Scale 2 in an Italian sample', Cyberpsychol Behav Soc Netw, Vol. 16 No. 10, pp. 761–6.

[37]. Griffiths, M. (2010), 'Internet abuse and internet addiction in the workplace', Journal of Workplace Learning, Vol. 22 No. 7, pp. 463-472.

[38]. Griffiths, M. D. and Szabo. A. (2014), 'Is excessive online usage a function of medium or activity? An empirical pilot study', J Behav Addict, Vol. 3 No. 1, pp. 74–77.

[39]. Guofeng, D. and Yuming, X. (2009), 'Internet addiction and mental health status of Chinese college freshmen', Paper presented at the 3rd International Conference on Bioinformatics and Biomedical Engineering, iCBBE 2009.

[40]. Halabi A. E., Hachem A., Al-Akhrass L., Artail H., Khan H.U. (2014), "Identifying the linkability between Web servers for Enhanced Internet Computing", 17th IEEE Mediterranean Electrotechnical Conference MELECON 2014, 13-16 April, Beirut, Lebanon. (Conference Proceeding)

[41]. Hassan, I. M., Khan, H. U. and Lalitha, M. (2016) 'Pedagogical Potentials of IEEE 802.11 WLAN to Nigerian Universities: A Case Study of the University of Uyo', International Journal of Information and Education Technology, Vol. 6, No. 4, pp. 256-261.

[42]. Hassan, I. M., Khan, H. U., Zaitun, R., Mardini, G. (2015), "Pedagogical Potentials of IEEE 802.11 WLAN to Higher Educational Institutions: A Case Study of Nigerian based University", IEEE 9th International Conference on Semantic Computing (IEEE ICSC 2015), Anhaim, CA, USA, Feb.7 - 9, 2015. (Conference Proceeding).

[43]. Heang, J.F., and Khan, H.U. (2015), "The Role of Internet Marketing in the Development of Agricultural Industry: A Case Study of China", Journal of Internet Commerce,Vol. 14, Issue.1 , pp. 1-49.

[44]. Ho, H. C., Awan, M. A., & Khan, H. U. (2016), "Luxury brands and corporate responsibility: A perspective on consumers' preferences", Journal of International Management Studies, 16(1), 77-81.

[45]. Huang, Z., Wang, M., Qian, M., Zhong, J., & Tao, R. (2007). Chinese Internet Addiction Inventory: Developing a measure of problematic Internet use for Chinese college students. Cyberpsychology and Behavior, 10(6), 805-811. doi: 10.1089/cpb.2007.9950

[46]. Jie, T, Yizhen, Y., Yukai, D, Ying, M., Dongying, Z. and Jiaji, W (2014), 'Prevalence of internet addiction and its association with stressful life events and psychological symptoms among adolescent internet users', Addictive Behaviors, Vol.39, pp. 744–747.

[47]. Karim, A. K. M. R., and Nigar, N. (2014), 'The internet addiction test: Assessing its psychometric properties in Bangladeshi culture', Asian Journal of Psychiatry, Vol. 10, pp. 75-83.

[48].Khan, H.U., Uwemi, S. (2018) "What are e-commerce possible challenges in developing countries: a case study of Nigeria", International Journal of Business and Systems Research, forthcoming. [Scopus Indexed, Inderscience].

[49]. Khan H.U., Awan M.A.(2017), "Possible Factors Affecting Internet Addiction: A Case Study of Higher Education Students of Qatar", Int. J. of Business Information Systems (IJBIS), Vol.26, No.2 pp.261:276.

[50]. Khan H.U., Awan M.A.(2017), "Possible Factors Affecting Internet Addiction: A Case Study of Higher Education Students of Qatar", Int. J. of Business Information Systems (IJBIS), Forthcoming.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[51].Khan, H.U. (2012) 'Computer Mediated Communication, Quality of Learning, and Performance', Journal of GSTF Business Review, Vol. 1, No. 3, pp. 81-88.

[52].Khan, H.U. (2013a) 'Use of e-learning tools to solve group work problems in higher education: A Case study of gulf countries', The Advances in Computer Science: an International Journal, Vol. 2, No. 3, pp.90-96.

[53].Khan, H.U. (2013b) 'Role of Computer Mediated Communication in Affect Empowerment and Performance Improvement', IFRSA's International Journal of Computing, Vol.3, No.3, P.165-171.

[54].Khan, H.U. (2016), "Possible effect of video lecture capture technology on the cognitive Empowerment of higher education students: a case study of gulf-based university", International Journal of Innovation and Learning, Vol.20, No. 1, pp. 68: 84.

[55].Khan, H.U. (2016), "Possible effect of video lecture capture technology on the cognitive Empowerment of higher education students: a case study of gulf-based university", International Journal of Innovation and Learning, Vol.20, No. 1, pp. 68: 84.

[56].Khan, H.U. and Adediji, O.A. (2017) 'Need for RADAR system utilisation for maritime traffic management: a case of Congo River Basin', Int. J. Computational Systems Engineering, Vol.3, No. 3., pp163:174

[57].Khan, H.U. and Alhusseini, A. (2015), "Optimized Web Design in the Saudi Culture", IEEE Science and Information Conference 2015, London, UK, July 28 - 30, 2015.

[58].Khan, H.U. and Ejike, A.C. (2017) "An assessment of the impact of mobile banking on traditional banking in Nigeria", Int. J. Business Excellence, Vol.11, No.4, pp.446:463.

[59].Khan, H.U. and Fournier-Bonilla, S. D. (2016), "Technological Infrastructure Effects on Export Diversification: A Case Study of Qatar", Northeast Decision Sciences Institute Conference, Alexandria, Virginia, USA, March 31st – April 2nd, 2016. (Conference Proceeding).

[60].Khan, H.U., Ahmed, S., Abdollahian, M. (2013) 'Supply chain technology acceptance, adoption, and possible challenges: A case study of service organizations of Saudi Arabia', 10th International Conference on Information Technology: New Generations (ITNG 2013), Las Vegas, Nevada, USA.

[61].Khan, H.U., Artail, H., Malik, Z., Niazi, M.(2014a) 'Information Technology Adoption, possible challenges, and Framework of Supply Chain Management: A Case Study of a Leading Gulf Economy', 4th International Conference on International Conference on International Conference on Engineering Technology and Technopreneurship, Kuala Lumpur, Malaysia.

[62].Khan, H.U., Awan, M.A., Ho. H.C. (2014b), "How do Chinese and Saudi Customers Perceive Online Service Quality? A Comparative Study", The Journal of Business Inquiry, Vol. 13, No. 2.pp.142-157.

[63].Khan, H.U., Bankole, O.A. and Alomari, M.K. (2017b) 'Possible effect of IT introduction into the election process: a case study of Nigeria', Int. J. Business Forecasting and Marketing Intelligence, Vol. 3, No. 2, pp.109-129.

[64].Khan, H.U., Fournier-Bonilla, S. D., Jinugu, A., Madhavi Lalitha, V.V. (2016), "Possible Challenges of the Successful Implementation of CRM in the Service Sector: A Case Study of Saudi Arabia", Northeast Decision Sciences Institute Conference, Alexandria, Virginia, USA, March 31st – April 2nd, 2016. (Conference Proceeding).

[65].Khan, H.U., Omonaiye, J.F., and Madhavi Lalitha, V.V. (2017a) "Employees' perception as internal customers about online services: A case study of banking sector in Nigeria', International Journal of Business Innovation and Research, Vol.13, No.2, pp.181:202.

[66].Khan, H.U., Uwemi, S. (2018) "Possible Impact Of E-Commerce Strategies On The Utilization Of E-Commerce In Nigeria', International Journal of Business Innovation and Research, vol. 15, No. 2., Pp. 231-246.

[67].Komninos, N. (2016), "Smart environments and smart growth: connecting innovation strategies and digital growth strategies", Int. J. of Knowledge-Based Development, 2016 Vol.7, No.3, pp.240 - 263

[68].Kuss, D. J., Shorter, G. W., Van Rooij, A. J., Griffiths, M. D. and Schoenmakers, T. M. (2014), 'Assessing Internet Addiction Using the Parsimonious Internet Addiction Components Model-A Preliminary Study', International Journal of Mental Health and Addiction, Vol. 12 No. 3, pp. 351-366.

[69].Laitinen, L., Osborne, M., Stenvall, J. (2016), "Complex regional innovation networks and HEI engagement - the case of Chicago", Int. J.

of Knowledge-Based Development, 2016 Vol.7, No.2, pp.184 – 201.

[70].Lemos, I. L., Cardoso, A. and Sougey, E. B. (2016), 'Cross-cultural adaptation and evaluation of the psychometric properties of the Brazilian version of the Video Game Addiction Test, Computers in Human Behavior 55 (2016) 207e213

[71].Loch, K., Straub, D. and Kamel, S. (2003), 'Diffusing the Internet in the Arab world: the role of social norms and technological culturation', IEEE Transactions on Engineering Management 50, 2003, pp. 45–63

[72].Lopez-Fernandez, O. (2015), 'How Has Internet Addiction Research Evolved Since the Advent of Internet Gaming Disorder? An Overview of Cyber addictions from a Psychological Perspective', Current Addiction Reports, Vol. 2 No. 3, pp. 263-271.

[73].Morahan-Martin, J. and Schumacher, P. (2003), 'Incidence and correlates of pathological internet use among college students', Computers in Human Behavior, Vol. 16, pp.13–29.

[74].Musa A., Khan, H.U., Alshare, K. (2015), "Factors influence consumers' adoption of mobile payment devices in Qatar", International Journal of Mobile Communications, Vol. 13, No. 6. pp. 670-689

[75].Omonaiye, J.F., Madhavi Lalitha., Khan, H.U., Signh, R., Fournier-Bonilla, S. D. (2015), "Ability and hurdle to provide Banking online services: A case study of banking employees in Nigeria", 2015 IEEE 2nd International Conference on Cyber Security and Cloud Computing, New York,USA, November 03 - 05, 2015. (Conference Proceeding)

[76].Pace, U., Zappulla, C., Guzzo, G., Di Maggio, R., Laudani, C. and Cacioppo, M. (2014), 'Internet Addiction, Temperament, and the Moderator Role of Family Emotional Involvement', International Journal of Mental Health and Addiction, Vol. 12 No. 1, pp. 52-63.

[77].Pawlikowski, M., Altstötter-Gleich, C. and Brand, M. (2013), 'Validation and psychometric properties of a short version of Young's Internet Addiction Test. Computers in Human Behavior', Computers in Human Behavior, Vol. 29 pp.1212–1223.

[78].Pontes, H. M., Patrão, I. M. and Griffiths, M. D. (2014), 'Portuguese validation of the internet addiction test: an empirical study', J Behav Addict, Vol. 3 pp. 107–14.

[79].Rose, G. and Straub, D. (1998), 'Predicting general IT use: applying TAM to the Arab world', Journal of Global Information Management, Vol. 6, pp. 39–46.

[80].Santos-Rodrigues, H., Fernández-Jardón, C. M., Dorrego, P. F. (2015), "Relation between intellectual capital and the product process innovation", Int. J. of Knowledge-Based Development, 2015 Vol.6, No.1, pp.15 – 33.

[81].Secades-Villa. R., Calafat. A., Fernández-Hermida, JR., Juan. M., Duch. M., Skärstrand, E., Becona, E. and Talic, S. (2014), 'Duration of Internet use and adverse psychosocial effects among European adolescents', Adicciones, Vol. 26 No. 3, pp. 247–53.

[82].Shapira, N. A., Lessig, M. C., Goldsmith, T. D., Szabo, S. T., Lazoritz, M., Gold, M. S. and Stein, D. J. (2003), 'Problematic Internet use: Proposed classification and diagnostic criteria', Depression and Anxiety, Vol. 17, pp. 207–216.

[83].Simsim, M. T. (2011), 'Internet usage and user preferences in Saudi Arabia', Journal of King Saud University – Engineering Sciences, Vol. 23, pp. 101–107.

[84].Smuts, R.G., Lalitha, M., Khan, H.U. (2017), "Change Management Guidelines That Address Barriers To Technology Adoption In An HEI Context", 7th IEEE International Advance Computing Conference, Hyderabad, India, January 5 – 7, 2017. (Conference Proceeding).

[84].Sun, T. and Wu, G. (2011), 'Trait Predictors of Online Impulsive Buying Tendency: A Hierarchical Approach', Journal of Marketing Theory and Practice, Vol. 19 No. 3, pp. 337-346.

[85].Szablewicz, M. (2010), 'the ill effects of "opium for the spirit": a critical cultural analysis of China's Internet addiction moral panic', Chinese Journal of Communication, Vol. 3 No. 4, pp. 453-470.

[86].Tang, J., Yu, Y., Du, Y., Ma, Y., Zhang, D. and Wang, J. (2015), 'Prevalence of internet addiction and its association with stressful life events and psychological symptoms among adolescent internet users', Addictive Behaviors, Vol. 39 No. 3, pp. 744-747.

[87].Thatcher, A. and Goolam, S. (2005), 'Defining the south African Internet 'addict': Prevalence and biographical profiling of problematic Internet users in South Africa', South African Journal of Psychology, Vol. 35 No. 4, pp. 766–792.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[88].Thatcher, A. and Goolam, S. (2005b), 'Development and psychometric properties of the Problematic Internet Use Questionnaire', South African Journal of Psychology, Vol. 35 No. 4, pp.793–809.

[88].Tsimtsiou, Z., Haidich, A.-B., Kokkali, S., Dardavesis, T., Young, K., and Arvanitidou, M. (2014), 'Greek Version of the Internet Addiction Test: A Validation Study', Psychiatric Quarterly, Vol. 85 No. 2, pp. 187-195.

[89].Uwemi, S., Khan, H.U. (2016), "E-commerce, Challenges, and Developing Countries", 2016 DSI Annual Meeting in Austin, TX, USA. November 19th – November 22nd, 2016. (Conference Proceeding).

[90].Uwemi, S., Khan, H.U., Fournier-Bonilla, S. D. (2016), "Challenges of E-Commerce in Developing Countries: Nigeria As Case Study", Northeast Decision Sciences Institute Conference, Alexandria, Virginia, USA, March 31st – April 2nd, 2016. (Conference Proceeding).

[91].Villella, C., Martinotti, G., Di Nicola, M., Cassano, M., La Torre, G., Gliubizzi, M.D., Messeri, I. Petruccelli. F., Bria, P., Janiri, L. and Conte, G. (2011), 'Behavioural addictions in adolescents and young adults: Results from a prevalence study', Journal of Gambling Studies, Vol. 27, pp. 203–214.

[92].Wee, C. Y., Zhao, Z., Yap, P. T., Wu, G., Shi, F., Price, T. and Shen, D. (2015), 'Disrupted brain functional network in internet addiction disorder: A resting-state functional magnetic resonance imaging study', PLoS ONE, Vol. 9 No. 9.

[93].West, R. (2005), 'Time for a change: putting the Trans theoretical (Stages of Change) Model to rest', Addiction, Vol. 100, pp. 1036–1039.

[94].Widyanto, L. and Griffiths, M. (2006). 'Internet Addiction: A Critical Review', International Journal of Mental Health and Addiction, Vol. 4 No. 1, pp. 31-51.

[95].Widyanto, L., Griffiths, M. D. and Brunsden, V. (2011), 'A psychometric comparison of the Internet Addiction Test, the Internet-Related Problem Scale, and self-diagnosis', Cyber psychology, behavior and social networking, Vol. 14 No. 3, pp. 141-149.

[96].Young, K. S. (1998), 'Caught in the Net: How to recognize the signs of Internet addiction and a winning strategy for recovery', New York: John Wiley.

[97].Young, K. S. (2011), 'CBT-IA: The First Treatment Model for Internet Addiction', Journal of Cognitive Psychotherapy, Vol. 25 No. 4, pp. 304-312.

[98].Youssef, K.A., H., Sobaihi, M.M.A., Taibah, A.A. (2014), "Collaboration models for knowledge management: the City of Jeddah, Saudi Arabia, as a case study", Int. J. of Knowledge-Based Development, 2014 Vol.5, No.2, pp.173 – 190.

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FIGURES AND TABLES

Table 1: Topics related to Internet Addiction and the Contributors

Topic	Contributors	Definition / Explanation
Internet's Popularity	(Evren et al., 2014);(Burnay et al., 2015); (Griffiths, 2010); (Eyadat et al., 2012);Awan et al., 2012; Najmi et al., 2015; Khan, 2016	Internet evolution has redefined the frontiers of the technology and facilitated the ease of access to information to the majority of the world. The estimate given by the researchers in 2012 revealed popularity of internet that one third of the world's population has access internet facility.
Internet's Demerits	(Burnay et al., 2015); (Griffiths, 2010); Pawlikowski et al. (2013); Khan, 2012; Khan,2013a; Askoul et al., 2016; Halabi et al., 2014; Hassan et al., 2016; Heang and Khan, 2015	As the concept of internet addiction is identified by APA, numerous researchers around the world concentrated on this issue and found the demerits of internet that are mainly because of the excessive usage of internet.
Internet Addiction (IA)	West (2005); Çardak (2013); Pawlikowski et al. (2013); (Cao and Su, 2007); Khan and Awan, 2017; Khan,2013b	One of the famous views is given that "the person's or being's feeling of necessity for something in order to sustain their existence and to continue their way of existence as they desire" is referred to as addiction towards internet or internet addiction (IA).
Types of IA	(Andreou and Svoli, 2013); (Young, 2011); Szablewicz (2010);Khan et al., 2014a;	Depending on the time spent for internet usage, it can be said whether it is a moderate usage of internet or over usage. As per the scholars, there are many types of internet addiction as per the domain concentrated on.
Numerical Definition of IA	(Morahan-Martin and Schumacher, 2003); (Beard and Wolf, 2001);Khan et al., 2013;	4.2 – 8.1 hours of internet usage per week – Normal Usage; More than 8.1 hours of usage per week – Excessive Usage or Addiction;
Need to Study IA	(Chen et al., 2015); (Khan et al., 2015); (Lopez-Fernandez, 2015); (Karim and Nigar, 2014); Khan et Al., 2014b	The alarming adverse effects of excessive internet usage in multiple dimensions demand the attention of the researchers to look into the impact personally, professionally and socially.
Reasons for IA	(Andreassen et al., 2012); (Aydin and Sari, 2011); (Cao and Su, 2007); Brock and Khan, 2017.	The issues that are leading to internet addiction can also be perceived as the resultant factors of internet addiction. E.g., inferiority complex of the individual.
Research on IA	(Tang et al., 2015); (Villella et al., 2011); (Pawlikowski et al., 2013); Szablewicz (2010); Khan and Uwemi, 2017;	As the adverse effects of internet usage are being observed and are found to have linkages with various social and behavioral phenomenon, researchers started looking into the nitty-gritties.
Types of Constructs for IA	(Khan et al., 2015); (Fernández-Villa et al., 2015); (Karim and Nigar, 2014); Khan et al., 2017a; Khan and Alhusseini, 2015;	Emotional/Psychological Conflict, Time management, Mood Management, Culture
Role of emotional/psychological conflict	(Pace et al., 2014); (Sun and Wu, 2011); American Psychiatric Association (APA); (Burnay et al., 2015); Das and Khan, 2016;	Role of emotional/psychological conflict is identified by many scholars as a cause and effect factor for IA. For instance, as a psychological disorder marked by APA; as a base to understand the personality of individuals using internet; as a cause of internet addiction. It is also mentioned that supporting the individuals emotionally and psychologically can keep them away from internet addiction.
Role of Mood Modification	APA's test for IGD; (Pontes et al., 2014); (Andreassen et al., 2012); Khan et al., 2016; (Kuss et al., 2014); Uwemi and Khan, 2016;	Mood modification, as a connected factor to the emotional and psychological constructs, helps to know about the internet gaming disorder. It is also perceived by authors on a positive note that mood modification is possible because of internet usage. The same opinion is considered in Bergen Work Addiction Scale (BWAS)
Role of Time Management	(Wee et al., 2015); (Andreou and Svoli, 2013); (Cheng et al., 2012); (Widyanto and Griffiths, 2006); Awan and Khan, 2016; Khan and Fournier-Bonilla, 2016;	Time management is identified as one of the prime indicators to know whether a person is addicted to internet or not. Not just for internet addiction disorders, time management is found to be a key component for many health related problems like insomnia, day time fatigue etcetera.
Role of Culture	(Fioravanti et al., 2013); (Szablewicz, 2010); (Ben-Yehuda, 2009); (Tsimtsiou et al., 2014); Musa et al., 2015; Bashir and Khan, 2016b; Omonaiye et al., 2016; Hassan et al., 2015; Bashir et al., 2016	The relation between cultural setting and problematic internet use is well-identified and hence it is considered as a base for constructing the Generalized Problematic Internet Use Scale 2. Also, the understanding about the role of culture on internet usage with the help of many theories helped to assess the causing factors for internet addiction among various cultures.

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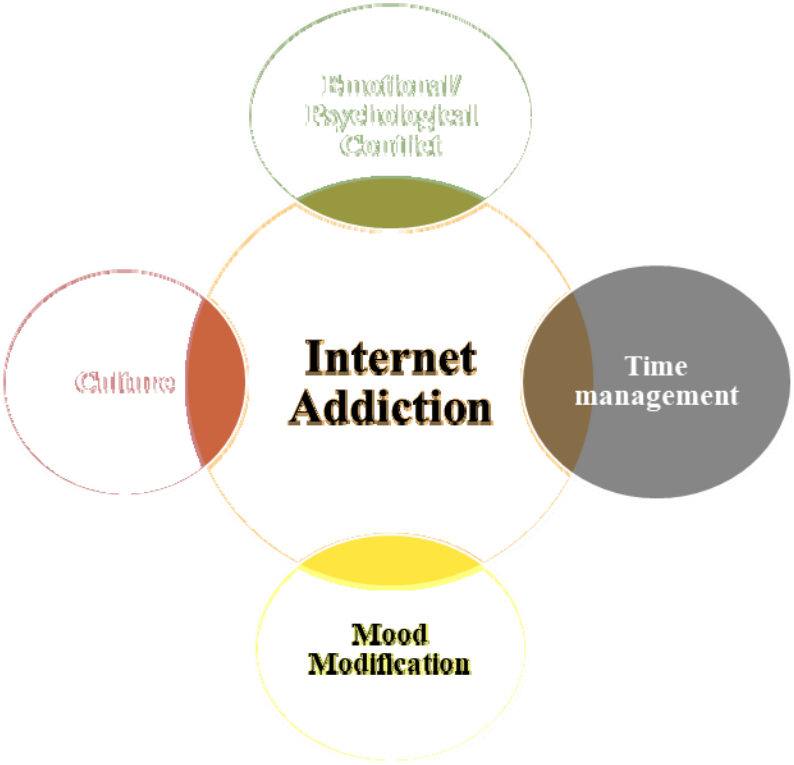

Fig 1: Linkages between various constructs of internet usage and interned addiction

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Table: 2 - Descriptive Statistics for the Internet Addiction Data

	Internet Addiction		
Variable	**No (%)**	**Yes (%)**	**P-Value**
	(N = 180)	**(N = 126)**	
Gender			0.62
Male	140(77.8)	86(68.3)	
Female	40(22.2)	40(31.7)	
Education			0.016*
High School	65(36.1)	29(23)	
College Graduate	44(24.4)	47(37.3)	
University Graduate	71(39.4)	50(39.7)	
Age			0.21
Young(<=24)	88(48.9)	73(57.9)	
Middle(25-44)	81(55)	44(34.9)	
Old(>44)	11(6.1)	9(7.1)	
Income Level			0.4
Low	76(42.2)	61(48.4)	
Middle	46(25.6)	33(26.2)	
High	58(32.2)	32(25.4)	
Nationality			0.35
Saudi Arabia	111(61.7)	71(56.3)	
Non-Saudi	69(38.3)	55(43.7)	
Emotional Index	13.55 ± 4.25	13.45 ± 4.15	
Time Mgt Index	15.88 ± 4.78	15.4 ± 4.83	
Mood Mgt Index	14.29 ± 5.17	13.39 ± 5.22	
Culture Index	16.54 ± 4.48	15.87 ± 4.42	

* refers to '< 0.05'

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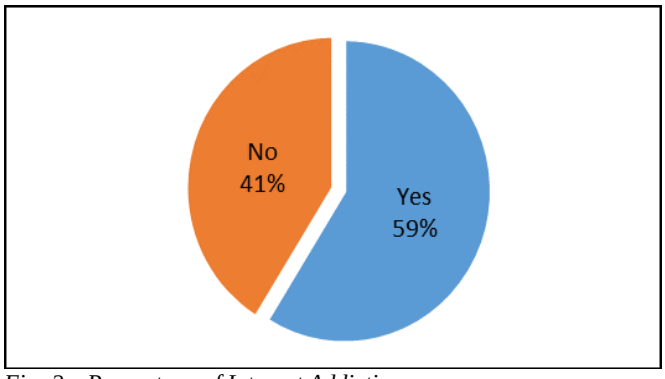

Fig: 2 – Percentage of Internet Addiction

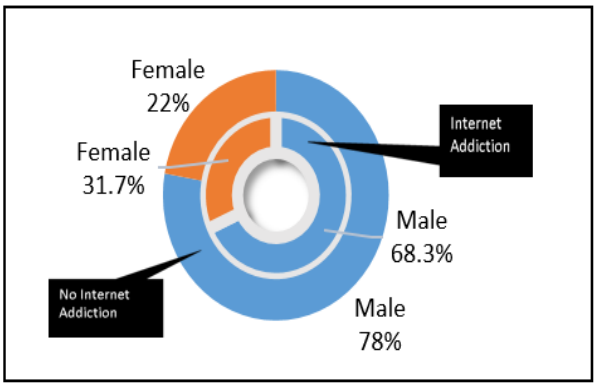

Fig: 3 – Internet addiction by gender

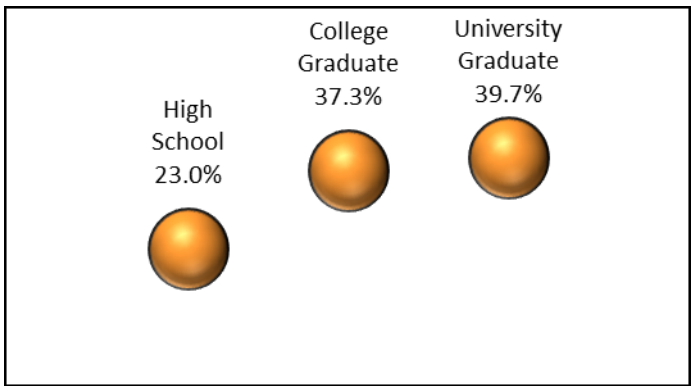

Fig: 4 – Relation between level of education and IA (Yes)

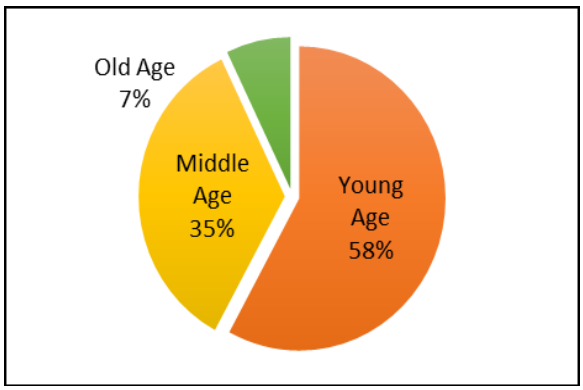

Fig: 5 – Relation between the Age and IA (Yes)

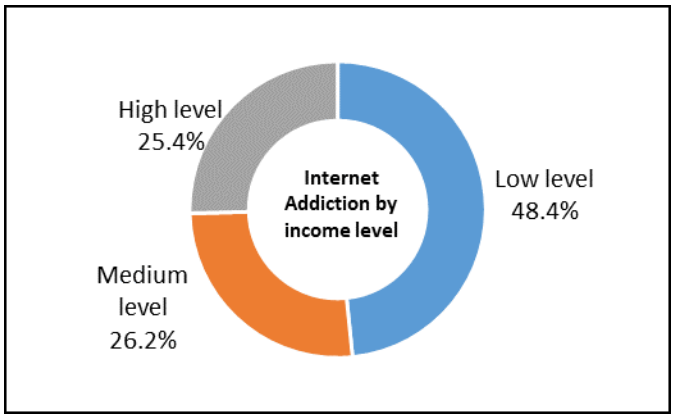

Fig: 6 – Relation between Income level and IA (Yes)

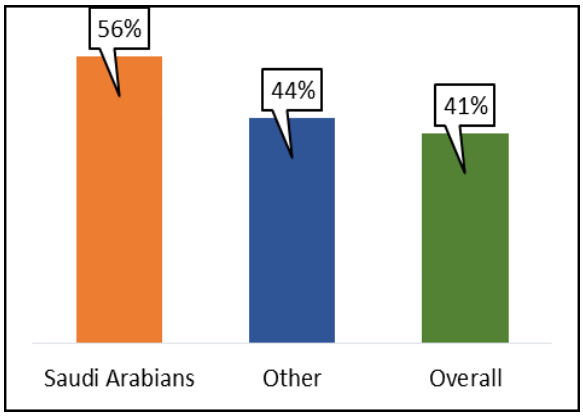

Fig: 7 – Relation between Nationality and IA (Yes)

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Table -3: Output of Binary Logistic Regression

VARIABLES	***ODDS RATIO***	***95% C.I.***
Gender(1)	1.150	(0.45 -2.89)
Education	*	
Education(1)	3.344*	(1.68-6.63)
Education(2)	1.884*	(1.02-3.45)
Age		
Age(1)	.846	(0.39-1.80)
Age(2)	.696	(0.18-2.64)
Income		
Income(1)	.643	(0.34-1.23)
Income(2)	.550	(0.29-1.04)
Nationality(1)	1.039	(0.49-2.22)
Emotional_index	1.270	(0.88-1.84)
Time_mgt_index	.842	(0.64-1.1)
Mood_mgt_index	1.050	(0.78-1.41)
Culture_index	.904	(0.68-1.21)

* refers to '< 0.05'

Table 4: Result of KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.733
Bartlett's Test of Sphericity	Approx. Chi-Square	3.223E3
	Degrees of freedom	36
	Sig.	.000

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Table 5: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.283	65.132	65.132	16.283	65.132	65.132	14.720	58.878	58.878
2	1.956	7.826	72.958	1.956	7.826	72.958	2.877	11.506	70.385
3	1.826	7.304	80.262	1.826	7.304	80.262	2.390	9.562	79.947
4	1.154	4.616	84.878	1.154	4.616	84.878	1.233	4.931	84.878
5	.928	3.713	88.591						
6	.565	2.261	90.851						
7	.434	1.735	92.586						
8	.346	1.384	93.970						
9	.302	1.208	95.179						
10	.254	1.015	96.193						
11	.227	.909	97.103						
12	.139	.555	97.657						
13	.111	.444	98.101						
14	.099	.397	98.498						
15	.077	.310	98.808						
16	.070	.279	99.086						
17	.062	.249	99.335						
18	.042	.170	99.505						
19	.040	.158	99.663						
20	.024	.095	99.758						
21	.021	.085	99.843						
22	.017	.068	99.911						
23	.012	.048	99.960						
24	.008	.031	99.991						
25	.002	.009	100.000						

Extraction Method: Principal Component Analysis.

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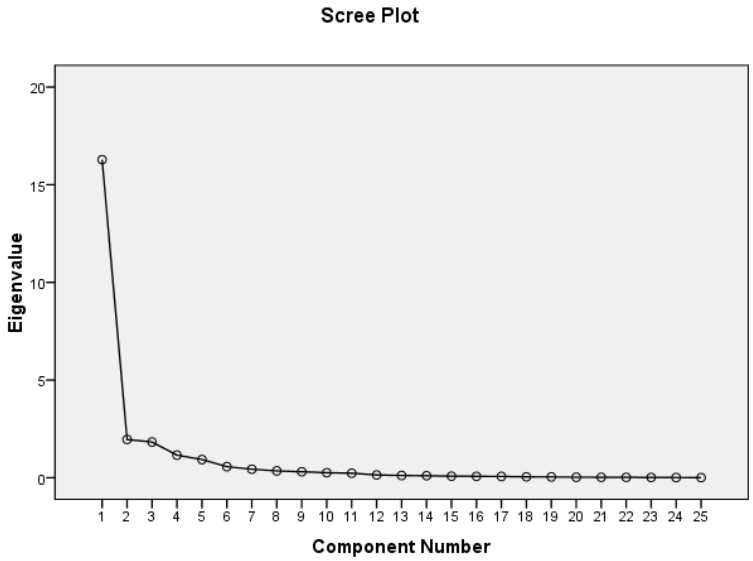
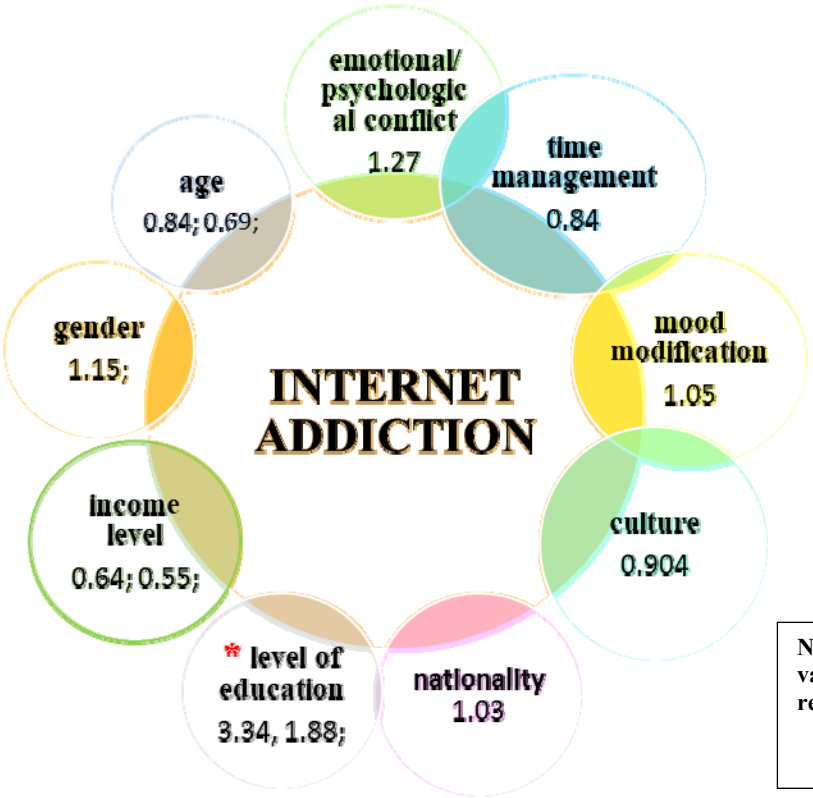


Fig: 7 - Scree Plot



Note: Odds ratio of the variables except the reference variable.

*** - Refers to significance**

Fig: 8 – Results of Logistic regression